Amendments to Claims:

1. (Currently Amended) A method for sensing and controlling the frequency of a laser with respect to an optical cavity including the steps of:

directing at least part of the laser beam to the optical cavity,

introducing a misalignment in ~~the~~ incident laser radiation associated with the laser beam ~~to the cavity~~ to produce ~~oscillation in the cavity of~~ substantially only a resonant TEM00 mode and a non-resonant TEM01 mode,

producing a single control beam resulting from modal interference of the TEM00 and TEM01 modes and detecting at least two spatially distinct portions of ~~a single~~ the control beam ~~reflected from the cavity~~ to produce at least two signals, each of the at least two signals indicative of the respective interference of the two correspondingly spatially distinct portions of the TEM00 mode with two correspondingly spatially distinct portions of the TEM01 mode, and

producing an error signal indicative of the difference between the TEM00 mode frequency and the cavity resonance frequency from the two signals.

2. (Currently Amended) A method as claimed in claim 1 including the step of detecting two spatially distinct portions of said ~~single~~ control beam of substantially equal size.

3. (Currently Amended) A method as claimed in claim 2 wherein each of said two spatially distinct portions each form about one half of the cross section of the control beam.

4. (Currently Amended) A method as claimed in any one of claims 1 to 3 wherein the misalignment of the incident ~~beam~~ laser radiation is achieved by tilting of the beam.

5. (Currently Amended) A method as claimed in any one of claims 1 to 3 wherein the misalignment of the incident ~~beam~~ laser radiation is achieved by offsetting of the beam.

6. (Currently Amended) A method as claimed in claim 5 wherein said ~~single~~ control beam reflected from the cavity is focused onto a detector.

7. (Currently Amended) A method for sensing and controlling a two beam interferometer such that the relative path length of the two beams is fixed, including the steps of:

introducing a misalignment between the two beams to produce substantially only a TEM00 mode and a TEM01 mode,

producing a single control beam resulting from the modal interference of the TEM00 and TEM01 modes,

detecting at least two spatially distinct portions of said control ~~a single~~ beam directed from the interferometer to produce at least two signals, each of the at least two signals indicative of the interference of the correspondingly spatially distinct portions of the TEM00 mode with the correspondingly spatially distinct portions of the TEM01 mode, and

producing an error signal indicative of the path length difference for the TEM00 modes from the two signals.

8. (Currently Amended) A method as claimed in claim 7 including the step of detecting two spatially distinct portions of said ~~single~~ control beam of substantially equal size.

9. (Currently Amended) A method as claimed in claim 8 wherein each of said two spatially distinct portions each form about one half of the cross section of the control beam.

10. (Currently Amended) A method as claimed in any one of claims 7 to 9 wherein the misalignment ~~of the incident beam~~ between the two beams is achieved by a relative tilt ~~tilting of the beam~~.

11. (Currently Amended) A method as claimed in any one of claims 7 to 9 wherein the misalignment ~~of the incident beam~~ between the two beams is achieved by a relative offset ~~offsetting of the beam~~.

12. (Currently Amended) A method as claimed in claim 11 wherein said ~~single~~ control beam reflected from the cavity is focused onto a detector.

13. (Currently Amended) An optical system for controlling the frequency of a laser, said system including:

an optical cavity,

means ~~to direct~~ for directing laser radiation into said cavity,

means ~~to introduce~~ for introducing a misalignment in the incident laser radiation to the cavity to produce ~~oscillation in the cavity of~~ substantially only a resonant TEM00 mode and a non-resonant TEM01 mode,

means for producing a single control beam resulting from the modal interference of the TEM00 and TEM01 modes and

means ~~to detect~~ for detecting at least two spatially distinct portions of ~~a single~~ said control beam reflected from the cavity to produce at least two signals, each of the at least two signals indicative of the respective interference of the two correspondingly spatially distinct portions of the TEM00 mode with two correspondingly spatially distinct portions of the TEM01 mode, and

means for producing ~~produce~~ an error signal indicative of the difference between the TEM00 mode frequency and the cavity resonance frequency from the two signals.

14. (Currently Amended) An optical system as claimed in claim 13 wherein said ~~detector~~ means for detecting detects two spatially distinct portions ~~of~~ said control beam of substantially equal size.

15. (Currently Amended) An optical system as claimed in claim 14 wherein each of said two spatially distinct portions each form about one half of the cross section of the control beam.

16. (Currently Amended) An optical system claimed in any one of claims 13 to 15 wherein the ~~means to introduce a~~ misalignment of the incident beam tilts ~~of~~ the beam.

17. (Currently Amended) An optical system as claimed in any one of claims 13 to 15 wherein the ~~means to introduce a~~ misalignment of the incident beam offsets of the beam.

18. (Original) An optical system method as claimed in claim 17 wherein the single beam reflected from the cavity is focused onto a detector by a lens.

19. (Currently Amended) A two beam interferometer including:

means ~~to introduce~~ for introducing a misalignment between the two beams to produce substantially only a TEM00 mode and a TEM01 mode,

means for producing a single control beam resulting from the modal interference of the TEM00 and TEM01 modes,

means for detecting ~~to detect~~ at least two spatially distinct portions of [[a]] said single control beam directed from the interferometer and produce at least two signals, each of the at least two signals indicative of the interference of the correspondingly spatially distinct portions of the TEM00 mode with the correspondingly spatially distinct portions of the TEM01 mode, and ~~means~~

a signal generator to produce from said two signals an error signal indicative of the path length difference for the TEM00 modes from the two signals.

20. (Currently Amended) A two beam interferometer as claimed in claim 19 wherein said ~~detector~~ means for detecting detects two spatially distinct portions of said control beam of substantially equal size.

21. (Original) A two beam interferometer as claimed in claim 20 wherein each of said two spatially distinct portions each form about one half of the cross section of the beam.

22. (Currently Amended) A two beam interferometer as claimed in any one of claims 19 to 21 wherein the ~~means to introduce a~~ misalignment between the two beams is a relative tilt ~~of the incident beam tilts of the beam~~.

23. (Currently Amended) A two beam interferometer as claimed in any one of claims 19 to 21 wherein the ~~means to introduce a~~ misalignment ~~the incident beam~~ between the two beams is a relative offset ~~offsets of the beam~~.

24. (Currently Amended) A two beam interferometer as claimed in claim 23 wherein the ~~single~~ control beam reflected from the cavity is focused onto a detector by a lens.